

ABSTRACT

A current control device is described wherein a pressure conduction composite is compressed and decompressed to alter its conductivity and thereby current conduction through the device. The pressure conduction composite is composed of a nonconductive matrix, a conductive filler, and an additive. The invention consists of electrodes, a nonconducting isolator, and pressure plates contacting the composite. Electrically activated actuators apply a force onto pressures plates. Actuators are composed of a piezoelectric, piezoceramic, electrostrictive, magnetostrictive, and shape memory alloy materials, capable of extending and/or contracting thereby altering pressure and consequently resistivity within the composite. In an alternate embodiment, two or more current control devices are electrically coupled parallel to increase power handling.